CLAIMS

What is claimed is:

1. A method for reducing noise in a digital image, the method comprising:

providing the digital image, the digital image comprising a plurality of channels with each of the channels comprising a set of pixel data signals; and

applying a filter to each of the sets of pixel data signals, wherein the filter applied to at least one of the sets of pixel data signals is different from the filter applied to another one of the sets of pixel data signals.

2. The method as set forth in claim 1 wherein the step of applying a filter further comprises replacing each individual pixel data signal within the set of pixel data signals with a median pixel data signal derived from a median value of adjacent pixel data signals within a set radius around the individual pixel data signal.

3. The method as set forth in claim 2 wherein the set radius is different for the different filters.

4. The method as set forth in claim 2 further comprising adjusting the set radius of pixel data signals in the filter for each of the channels of the digital image based on at least one factor.

5. The method as set forth in claim 3 wherein the factor comprises a duration of exposure for capturing the digital image.

6. The method as set forth in claim 1 wherein the plurality of channels comprises a red channel, a green channel, and a blue channel.

7. The method as set forth in claim 1 further comprising applying a color-space transformation to the sets of pixel data signals before the step of applying a filter.

8. The method as set forth in claim 1 further comprising:

identifying the pixel data signals in each set of pixel data signals with at least a first characteristic; and

restricting the application of the filters to the unidentified pixel data signals in each set of pixel data signals.

9. The method as set forth in claim 8 wherein the first characteristic is noise at or above a first threshold level.

10. A method for reducing noise in a digital image comprising:

providing the digital image comprising red, green, and blue channels;

transforming the red, green, and blue channels to an achromatic channel and two chrominance channels, wherein the achromatic channel and the two chrominance channels each comprise a set of pixel data signals; and

applying a filter to each of the sets of pixel data signals, wherein the filter applied to at least one of the sets of pixel data signals is different from the filter applied to another one of the sets of pixel data signals.

11. The method as set forth in claim 10 wherein the step of applying a filter further comprises replacing each individual pixel data signal within the set of pixel data signals with a median pixel data signal derived from a median value of adjacent pixel data signals within a set radius around the individual pixel data signal.

12. The method as set forth in claim 11 wherein the set radius is different for the different filters.

13. The method as set forth in claim 11 further comprising adjusting the set radius of pixel data signals in the filter for each of the channels of the digital image based on at least one factor.

14. The method as set forth in claim 13 wherein the factor comprises a duration of exposure for capturing the digital image.

15. The method as set forth in claim 10 further comprising:

identifying the pixel data signals in each set of pixel data signals with at least a first characteristic; and

restricting the application of the filters to the unidentified pixel data signals in each set of pixel data signals.

16. The method as set forth in claim 15 wherein the first characteristic is noise at or above a first threshold level.

17. A method for reducing noise in a digital image, the method comprising:

providing the digital image, the digital image comprising a plurality of channels with each of the channels comprising a set of pixel data signals;

identifying the pixel data signals in each set of pixel data signals with at least a first characteristic; and

applying a filter to the identified pixel data signals in each of the sets of pixel data signals.

18. The method as set forth in claim 17 wherein the first characteristic is noise at or above a first threshold level.

19. The method as set forth in claim 17 wherein the step of applying a filter further comprises replacing each individual pixel data signal within the set of pixel data signals with a median pixel data signal derived from a median value of adjacent pixel data signals within a set radius around the individual pixel data signal and wherein the filter applied to at least one of the sets of pixel data signals is different from the filter applied to another one of the sets of pixel data signals.

20. The method as set forth in claim 19 wherein the set radius is different for the different filters.

21. The method as set forth in claim 19 further comprising adjusting the set radius of pixel data signals in the filter for each of the channels of the digital image based on at least one factor.

22. The method as set forth in claim 21 wherein the factor comprises a duration of exposure for capturing the digital image.

23. The method as set forth in claim 17 wherein the plurality of channels comprises a red channel, a green channel, and a blue channel.

24. The method as set forth in claim 17 further comprising applying a color-space transformation to the sets of pixel data signals before the step of applying a filter.

25. An imaging system comprising:

an image sensor apparatus for capturing a digital image comprising a plurality of channels with each of the channels comprising a set of pixel data signals; and

a filter system comprising at least two different filters, each of the filters filtering at least one of the sets of pixel data signals for one of the channels, wherein the filter applied to at least one of the sets of pixel data signals is different from the filter applied to another one of the sets of pixel data signals.

26. The system as set forth in claim 25 wherein the filters each replace each individual pixel data signal within the set of pixel data signals with a median pixel data signal derived from a median value of adjacent pixel data signals within a set radius around the individual pixel data signal.

27. The system as set forth in claim 26 wherein the set radius is different for the different filters.

28. The system as set forth in claim 26 wherein the set radius of pixel data signals in the filter for each of the channels of the digital image is adjustable.

29. An imaging system comprising:

an image sensor apparatus which captures a digital image comprising red, green, and blue channels;

a transformation system coupled to the image sensor apparatus which transforms the red, green, and blue channels to an achromatic channel and two chrominance channels, wherein the achromatic channel and the two chrominance channels each comprise a set of pixel data signals; and

a filter system comprising at least two different filters, each of the filters filtering at least one of the sets of pixel data signals for one of the achromatic or chrominance channels, wherein the filter applied to at least one of the sets of pixel data signals is different from the filter applied to another one of the sets of pixel data signals.

30. The system as set forth in claim 29 wherein the filters each replace each individual pixel data signal within the set of pixel data signals with a median pixel data signal derived from a median value of adjacent pixel data signals within a set radius around the individual pixel data signal.

31. The system as set forth in claim 30 wherein the set radius is different for the different filters.

32. The system as set forth in claim 30 wherein the set radius of pixel data signals in the filter for each of the channels of the digital image is adjustable.

33. An imaging system comprising:

an image sensor apparatus for capturing a digital image comprising a plurality of channels with each of the channels comprising a set of pixel data signals;

a masking system which identifies the pixel data signals in each set of pixel data signals with at least a first characteristic; and

a filter system applying a filter to the unidentified pixel data signals in each of the sets of pixel data signals.

34. The system as set forth in claim 33 wherein the first characteristic is noise at or above a first threshold level.

35. The system as set forth in claim 33 wherein the filters each replace each individual pixel data signal within the set of pixel data signals with a median pixel data signal derived from a median value of adjacent pixel data signals within a set radius around the individual pixel data signal, wherein the filter applied to at least one of the sets of pixel data signals is different from the filter applied to another one of the sets of pixel data signals.

36. The system as set forth in claim 35 wherein the set radius is different for the different filters.

37. The system as set forth in claim 35 wherein the set radius of pixel data signals in the filter for each of the channels of the digital image is adjustable.

38. The system as set forth in claim 33 further comprising a transformation system coupled to the image sensor apparatus which transforms the red, green, and blue channels to an achromatic channel and two chrominance channels, wherein the achromatic channel and the two chrominance channels each comprise a set of pixel data signals.

39. The system as set forth in claim 33 wherein the masking system comprises a memory for storing the identified pixels for the image sensor apparatus.

40. The method as set forth in claim 1 further comprising:

capturing the digital image with a sensor;

identifying pixels in a set of pixels for the sensor with a first characteristic;

storing a map of the identified pixels for the sensor; and

restricting the application of the filters to the pixel data signals in the unidentified pixels in the set of pixels for the sensor.

41. The method as set forth in claim 40 wherein the first characteristic is noise susceptability above a first threshold.

42. The method as set forth in claim 10 further comprising:

capturing the digital image with a sensor;

identifying pixels in a set of pixels for the sensor with a first characteristic;

storing a map of the identified pixels for the sensor; and

restricting the application of the filters to the pixel-data signals in the unidentified pixels in the set of pixels for the sensor.

43. The method as set forth in claim 42 wherein the first characteristic is noise susceptability above a first threshold.